Cyberloafing: a Learning Tool for Senior Surfers?

Hester Brakel

Student number: 2566548
Supervisor: dr. K. Mortier
Second assessor: dr. F.R. Kappe
Master thesis Work and Organizational Psychology
August, 2016
Vrije Universiteit Amsterdam

Acknowledgements

Looking back at four intense but inspiring months, I am pleased to present this master thesis, titled “Cyberloafing: A Learning Tool for Senior Surfers?” to you. The process of writing a master thesis is characterized by ups and downs. I luckily did not have to deal with those all by myself. I would like to take this opportunity to thank some people that supported me during this process. First, I would like to thank Karen Mortier, my master thesis supervisor. Due to her support and critical look, my thesis is definitely brought to a higher level. Secondly, I would like to especially thank Jenny Huijs, my internship supervisor at TNO, for supporting and inspiring me during the whole process. Without her enthusiastic input, it would have been four tough months. Thirdly, I want to thank my colleague Jos Sanders, also from TNO, for his bright and inspiring ideas about this topic, and for distributing my online survey across his professional network. Fourthly, I would like to thank my second assessor Rutger Kappe, for providing me with feedback on my research proposal. Finally, I would like to say many thanks to my dear parents and close friends, for their unconditional support and insightful feedback during the hard times of this process.

Abstract

Older workers sometimes experience age-related difficulties in keeping track of what became so important to function in the digital era: digital skills. The ubiquity of internet in society and the work domain makes digital skills vital assets for living and working. This study investigated whether there still is a difference in the level of digital skills between younger and older workers. Furthermore, the role of "cyberloafing" - internet use for personal purposes during office hours - in the development and maintenance of digital skills among older workers is investigated, in order to answer the research question *"what is the role of cyberloafing in the employability of older workers?"*. A cross-sectional research is conducted through an online survey among employees younger and older than 50 years of age. A significant, but very small, difference in the level of digital skills has been found between the age groups. In contradiction with existing literature, no direct influence of cyberloafing behavior on individual work performance has been found. Little evidence was found for a positive relationship between cyberloafing and digital skills, whereas a stronger positive relationship has been found between digital skills and individual work performance. A practical implication is to at least not prohibit cyberloafing, and focus on ways to develop and maintain digital skills of older workers, in order to keep them employable to their delayed retirement.

Keywords: cyberloafing, digital skills, employability, retirement, older workers.

Cyberloafing: A Learning Tool for Senior Surfers?

The European workforce is aging, and the number of aged people will increase in the following decades (Sanders et al., 2013). As the demographic pyramid has never before been so unbalanced (CBS, 2016), it will have a great impact on social security, the western world has got used to after World War II. The size of the graying baby-boom generation influences the financial sustainability of the actual pension systems. As the European population gained longevity, European countries are forced to adapt the pension system and delay the mandatory retirement age (De Grip, Dupuy, Jolles & van Boxtel, 2015). The Dutch government decided in 2012 to raise retirement age gradually up to 67 years old (Van Duin & Stoeldraijer, 2012). Remarkably, raising the retirement age appears above all to be an economic decision, not taking into account a few important human issues. Four main issues will be mentioned to illustrate this. First of all, cognitive skills decline rapidly after middle age (Charchat-Fichman, Caramelli, Sameshima & Nitrini, 2005; Deary et al., 2009). For example, reasoning ability and speed of mental processing decrease from middle age onwards, or sometimes even earlier (Deary et al., 2009). Secondly, older adults lag behind in frequency of digital media use and digital skills, compared to their younger colleagues (De Haan, Huysmans & Steyaert, 2002). Thirdly, - and related to the previous argument - older adults are physically and psychologically disadvantaged with regard to using new technologies (Morris & Venkatesh, 2000). Fourth, older employees disengage more from work when approaching their planned retirement age (Damman, Henkens & Kalmijn, 2013). In contrast to these predominantly negative issues stands that older employees can definitely be valuable for an organization as well. Older employees might lack in the issues mentioned above, they do possess a set of valuable knowledge and experience (Stevens, 2010). This is something their younger colleagues do not yet have, since they entered the labor force at a later date. Organizations fear the moment the baby-boom generation leaves the company,

taking the wealth of knowledge and experience with them (Paton, 2008). It is very important to transfer this knowledge and experience, to maintain continuity of knowledge and to remain competitive (Calo, 2008). As the labor force is aging, the use and maintenance of physical, mental and cognitive skills of employees are top priority, in order to keep the aging work population employable (Sanders et al., 2013).

Because technology is omnipresent in the work domain and technological changes dominate the day, mastering digital skills is essential to remain employable. As predicted by Dohm and Shniper (2007), computer related professions proved to grow faster than any other jobs between 2006 and 2016 and continue to do so. Moreover, professions that are not specifically computer related rely heavily on the infinite possibilities of Information Communication Technology (ICT) as well. Apart from the benefits the internet involves, the use of internet in the workplace has also allowed new ways in which employees can be distracted from their work. Lim (2002) first introduced the concept of "cyberloafing", defining it as employees using their company's internet access for non-work-related purposes during working hours. The main focus in cyberloafing research so far is on possible disadvantages (Roman, 1996; Verton, 2000; Lim, 2002; Mahatanankoon, 2006). This focus is understandable, since people were cyberloafing 38 minutes on average in 2006 and the average time in 2012 was estimated on 51 minutes on a regular workday (Lim & Chen, 2012). This actually means employees were not productive for the company during these minutes. A side note that is relevant here, is the faded boundary between work and private, due to technological development. Technology facilitated huge changes in how, where and when people do their work (Quesenberry & Trauth, 2005). People use internet access at work for personal purposes, but they are more and more available outside working hours for work purposes as well. This makes it valuable to broaden the look on cyberloafing behavior and expand the knowledge about potential positive effects. In the context of the aging workforce,

cyberloafing could, apart from the above mentioned loss of productivity, also have possible benefits. Digital skills are necessary to be able to master the process of implementing new technologies (Van Dijk, 2005). People need a lot of practice to develop and maintain the highly necessary digital skills (Van Dijk, 2005). When retirement approaches, employees tend to decrease their work investments, activities and motivation (Damman, et al., 2013). Their focus shifts from work related activities to non-work related activities. Cyberloafing is a non-work related activity that can be easily carried out at work. This shift to non-work related activities does not have to be entirely harmful, if those activities contribute to the employability of older workers in a certain way. For example, it could contribute to the development of digital skills. Based on this argumentation, the following research question is formulated: *RQ: What is the role of cyberloafing in the employability of older workers?*

Keeping older workers employable is important for several reasons mentioned before. In an environment where change dominates the day, keeping them employable is a challenge both society and Human Resource professionals face. Especially, when taking into account the earlier mentioned difficulties older workers come across. For both parties it would be very useful to have more insights in how to deal with this challenge. Employees being longer employable is not only beneficial for employers and society, the employees themselves can experience advantages as well. Early retirement was found to increase cognitive decline, since after retirement people generally venture into an undemanding environment and lose the stimulus to invest in cognitive repair activities (Mazzonna & Peracchi, 2012). Participation in mental or intellectually stimulating activities has been shown to predict reduced cognitive decline (Whalley, Deary, Appleton & Starr, 2004). Active employment in a later professional career allows one to prolong his or her cognitive assets. Research also found that retirement age has a significant effect on the age of onset of Alzheimer's disease (Lupton et al., 2010). So from this perspective, enlarging the attractiveness of late retirement

could be beneficial from an employee's individual perspective, as well as from a social perspective. Knowing this, investigating whether cyberloafing could contribute to older workers' digital skills to keep them longer employable, seems an interesting and relevant research topic. In particular, because the aging of the labor force will continue the coming decades and the importance of the technology in organizations is not expected to diminish at short notice.

Cyberloafing, Digital Skills and Work Performance

To answer the research question "What is the role of cyberloafing in the employability of older workers?" four hypotheses are formulated and a conceptual model is drawn (see figure 1, page 12). The first hypothesis is about the differences in digital skills between age groups. Digital skills are being considered as vital assets in today's society. De Haan et al. (2002) argue that digital skills of older workers lag behind their younger colleagues' skills because they have not had the opportunity to practice during their formal education. To investigate whether this "digital divide" between age groups is still the case, two age groups will be included in this study; employed people younger than 50 years old, and employed people aged 50 years and older. Based on the argument of De Haan et al. (2002), the age of 50 years old has been chosen as cut-off point, because people older than 50 years were – most likely – already working when the rise of the internet occurred in the late nineties. People under 50 years old got acquainted more naturally with the internet in an earlier stage of their school career or during their studies and early professional life. Older adults acquired different kind of skills during their formal education than their younger colleagues. In todays' knowledge society, there is a visible shift in learning experiences. "Know-how" and "know-what" is being supplemented with "know-where". This means the understanding of where to find and how to access relevant knowledge became very important to function in our knowledge society. The ability to learn what is needed for tomorrow became more important

than what people know today (Siemens, 2005). The difference in educational background in combination with lower learning capabilities due to cognitive decline (Charchat-Fichman et al., 2005; Deary et al., 2009), pushes older adults into a difficult position in the labor market, where digital skills became indispensable (Van Dijk, 2005). To remain nimble of mind, and an active, competitive employee, profitable in the labor market, older adults must use and keep using technology. Research showed age-related differences in older adult's learning and use of computer and the Internet. The difficulties people experience beyond middle age, are age associated changes in visual, perceptual, psychomotoric, and cognitive abilities (Xie, 2003). Likewise, Hargittai (2002) found that age is negatively related with one's level of internet skills. Based on this, one could argue that the level of digital skills declines with age. However, it seems unlikely that when people have reached a certain level of skills, this level decreases in the years after. Therefore, the first hypothesis is formulated as a comparison between the proposed age groups: *H1: Employees aged 50 years and older have a lower level of digital skills than employees younger than 50 years old.*

The second hypothesis concerns the effect of cyberloafing on individual work performance of older workers. Since employability is a very wide concept, this study focusses on "individual work performance" as outcome measure, because it is more specific and measurable. With regard to cyberloafing, this study primarily holds Lim's (2002, p. 677) definition; "any voluntary act of employees using their company's internet access during office hours to surf non-job related websites for personal purposes and to check (including receiving and sending) personal e-mail as misuse of the internet". Because technology kept changing rapidly since this definition was formulated in 2002, in this study more activities will be added to the operationalization of cyberloafing. Online shopping, personal investment management, and social networking are considered to be cyberloafing behavior as well (Blanchard & Henle, 2008; Lim, Teo & Loo, 2002; Ugrin & Pearson, 2008). Taking long

lunchbreaks, being "restroom-minded", socializing with colleagues, or making personal phone calls are easily interpreted as loafing. The nature of internet usage makes cyberloafing more difficult to recognize and observe (Wagner, Barnes, Lim & Ferris, 2012). Employees can pretend being hard at work while they are venturing into cyberspace by surfing websites for personal interests and purposes. Cyberloafers can stay at their own desk, in contrast to for example long lunchers. Lim (2002) characterizes cyberloafing as non-productive behavior that detracts from an employee's level of work performance. In line with this, Mastrangelo, Everton and Jolton (2006) argue that cyberloafing behavior leads to losses in productivity and revenue. When people engage in cyberloafing, their focus is set on a different target than their work, which suggests they cannot be productive for the company at the same time. Moreover, research on task switching has shown that older adults experience more difficulties with switching from one task to another than younger adults (Kray & Lindenberger, 2000; Reimers & Maylor, 2005). The direct effect of cyberloafing on individual work performance is therefore expected to be negative. Based on this, the second hypothesis is formulated: *H2: Cyberloafing has a negative effect on individual work performance.*

Since the focus of this study is on potential benefits of cyberloafing behavior, the third and fourth hypothesis concern a more positive approach. The third hypothesis is about the effect of cyberloafing on digital skills of older workers. Technological developments and the World Wide Web caused major changes in the way people live and work. With the rise of the "connected" workplace in the late nineties (Ryan, 2010), communication became easier and faster. The average production has generally improved, by automating certain activities and by supporting employees in their daily tasks (Wallace, 2004). The growth of the internet as both communication and service delivery device has a great impact on employability. Employers consider the use ICT as a "key transferable skill" (McQuaid & Lindsay, 2005).

Transferable skills are skills that can be taken from one situation to another and from one job to another. Many employers, irrespectively of the work field, consider these skills as a meaningful component of employability (Johnson & Burden, 2003; Belt & Richardson, 2005). For technology to improve productivity, it must be accepted and used by employees in organizations. A crucial step in appropriation of digital media is to acquire skills (Van Dijk, 2005; Van Dijk & Van Deursen, 2014). Van Dijk and Van Deursen (2014) introduced a comprehensive framework of six categories of digital skills, which comprises the skills every user requires to command the internet in a satisfactory manner. This framework consists of "operational skills" (technical skills to command digital media) and "formal skills" (browsing and navigating). Apart from those two medium-related skills, there are four content-related skills, namely "information skills" (the ability to search, select and evaluate information in digital media), "communication skills" (the ability to communicate on mostly the Internet), "content creation skills" (the ability to generate content) and "strategic skills" (using a digital medium for a particular personal or professional goal). Meyers, Erickson and Small (2013) cite the importance of informal learning, next to formal learning, in the development of digital skills. Formal learning takes place in school or at work, whereas informal learning takes place in other contexts, such as the home environment, social groups or affinity spaces online. When employees engage in cyberloafing behavior they might not be productive. However, one could argue they engage in a certain type of informal learning, and practice digital skills. Since digital practice is highly necessary to develop digital skills, the following hypothesis is formulated: *H3: Cyberloafing has a positive effect on digital skills.*

It is taken into account that the direction of this hypothesis can be formulated the other way around as well. After all, a certain level of digital skills is needed to be able to engage in cyberloafing behavior. Moreover, it seems likely that mastering digital skills can increase cyberloafing, since it is more accessible for digital skillful employees to engage in

this behavior. In this study, cyberloafing is deliberately chosen as independent variable, because the focus is on the potential contribution of cyberloafing to digital skills and employability.

The fourth and final hypothesis concerns digital skills and individual work performance of older workers. Technological improvement is one of the most influential drivers of productivity (Bosworth & Collins, 2003; Easterly & Levine, 2001). It is a challenge for organizations, especially those who operate in dynamic environments where the state of knowledge changes at a continuous and fast rate, to keep their workers up-to-date with those changes. Especially older workers, because they experience more difficulties in adapting to and keeping up with changes (Xie, 2003). Digital literacy is a fast growing topic in the knowledge society of 2016. Digital literacy is defined as "the ability to access digital media and ICT, to understand and critically evaluate different aspects of digital media and media contents and to communicate effectively in a variety of contexts" (Ala-Mutka, Punie & Redecker, 2008, p. 1). Digital literacy is even included as "competence" in the *Recommendation on Key Competences* of the European Commission (EC, 2006) that provides the necessary context (i.e. the knowledge, skills, and attitudes) for working, living and learning in the knowledge society. In the late nineties, Marchi (1999) already stated that organizations will need to innovate faster than ever if they hope to compete, prosper and survive. Marchi (1999) states knowledge as a key resource, which is unique and can be created from nothing. However, in order to create knowledge, it must be shared. When employees master digital skills they will communicate easier and faster, and will be able to easily distil knowledge from different sources and share it with the rest of the organization. In organizations where knowledge is one of the main production factors and information processing is based on ICT, the use of digital media to communicate is crucial for the successful performance and competitiveness of firms (Meyer, 2007). Leahy and Wilson

(2014) state that digital skills are crucial to perform well in all areas of employment. One could argue digital skills are a key to perform well in an organization where ICT is widely used. Based on this, the following hypothesis is formulated: *H4: Mastering digital skills has a positive effect on individual work performance.*

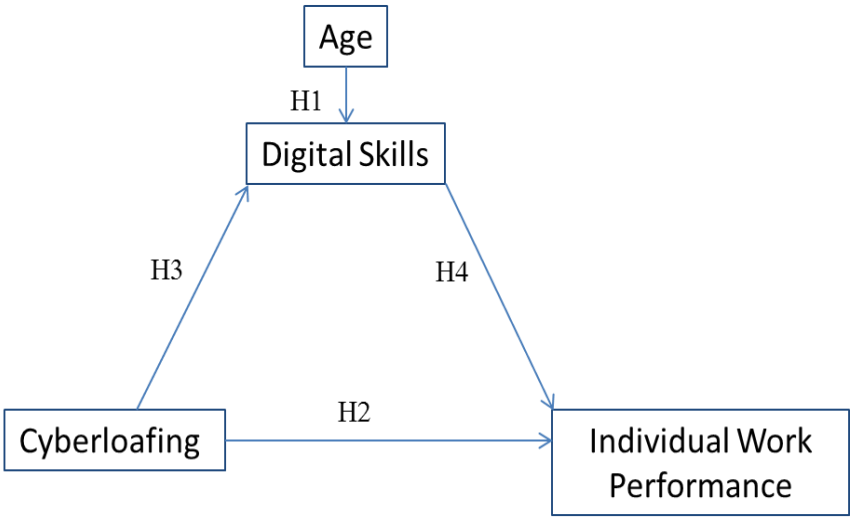


Figure 1. Conceptual model

Method

Sample

The population in this study involved employed people, who live and work in the Netherlands. Employment was an important entry requirement, since this study focuses on work-related constructs. Although digital media are indispensable for almost all organizations and jobs in 2016, for this study it is important to be sure that use of internet is necessary for the respondents to perform their tasks. Therefore, one item was added to the online survey, to verify the necessity of internet use in the daily tasks of the respondents; "*How often is it necessary for your daily tasks to use a desktop computer, laptop or tablet*

with internet access?". Response options were: 1 = "Never", 2 = "Monthly", 3 = "Weekly", 4 = "Daily: a small part of my working day", 5 = "Daily: a large part of my working day". Respondents who answered "Never" or "Monthly" were excluded from the dataset. A stratified sample method is used, because respondents were, besides being employed, selected according to age. To test hypothesis one: "Employees aged 50 years and older have a lower level of digital skills than employees younger than 50 years old", two age groups were included in this study; employed people younger than 50 years old and employed people aged 50 years and older.

The respondents have been recruited through a snowball sampling method and are part of the researcher's own network and employees of organizations where the researcher has connections. Examples of organizations that have participated are TNO, Achmea, Effectory and AON. To determine the sample size, a statistical power analysis was conducted. There are three inter-related concepts to calculate this: power, effect size, and alpha. Sample size is a function of those three (Cohen, 1988). The type of analysis had to be determined as well, which is a univariate regression analysis and a multivariate regression analysis. The power analysis (alpha = .05, effect size Cohen's *d*= .3, power = .9) showed that a sample size of 61 per group is desirable. Because two age groups are included, a sample size of 120 was the target.

Participants

The online survey was distributed among approximately 500 people. Two hundred thirty-six respondents completed the online survey (N=236). Four respondents answered "Never" or "Monthly" on the item about the necessity of internet use, and therefore did not meet the criteria of this sample. They are excluded from the data set. Two respondents did not fill in their age, and were therefore not able to be classified into one of the age groups. They are excluded from the dataset as well. One hundred thirty-three (N=133) working

people *under* 50 years completed the online survey (66 men, 63 women, 3 did not want to tell their gender, *M*age = 33.39, age range 21 - 49 year). Ninety-seven (N=97) working people *above* 50 years completed the online survey (45 men, 47 women, 5 did not want to tell their gender, *M*age = 57.85, age range: 50 - 73 years). In this group, 87.6 % was higher educated. 50.5% of the respondents in this age group is employee, 17.5% supervisor, 15.5% managing board and 16.5% chose the response option "different". Average time spent on cyberloafing was 30 minutes. In the whole sample, 88.4 % was higher educated (HBO or WO). 64.7% of the respondents is employee, 12.1% supervisor, 7.3% managing board and 15.9% chose the response option "different". Thirty-five and a half percent of the respondents spends between one and five hours on a desktop computer, laptop or tablet with internet access on a regular workday. Furthermore, 64.7% of the respondents spends between five and nine hours on a computer, laptop or tablet with internet access on a regular workday. Average cyberloafing time was 34 minutes a day (M_{50-} =36 minutes, M_{50+} = 30 minutes). Results of an independent samples T-test on differences in cyberloafing behavior and individual work performance between the two age groups, are presented in appendix A, table 1 and 2.

Procedure

In order to conduct this cross-sectional research design, data are gathered through a one-time online survey (see appendix B for the complete survey). The online survey started with informed consent. Respondents were informed that this survey is part of a study conducted by the VU. The confidential character of the study is emphasized. Respondents were not provided with the full details of the study, as it might influence the outcomes. The intention of the survey is however shortly discussed in the informed consent. Furthermore, the estimated time to fill in the survey was mentioned (approximately 10 minutes), as well as how to contact the researchers for questions. Participation in the online survey was completely voluntary. Respondents were asked to fill in self-report items about respectively,

digital skills, cyberloafing behavior, and individual work performance. In the last part of the survey, respondents were asked to fill in some socio-demographical data and work-related information. No names or other identifying information was asked, to ensure anonymous processing of the answers. If participants felt uncomfortable for any reason, they were able to withdraw from the survey at any time without any penalties.

Measurements

Cyberloafing. Lim and Teo (2005) developed a 13-item scale to measure the prevalence of cyberloafing behavior. An example item is *"During office hours, how often do you use the Internet at work to visit entertainment-related websites for personal reasons?"* Answers are given on a 5-point Likert scale, ranging from 1 "never" to 5 "always". The items can be subdivided in two main categories, defined as *browsing* (using company Internet access to browse non-work related websites while at work) and *e-mailing* (sending, receiving and checking non-work related emails while at work). It should be noted that Lim and Teo (2005) focus on cyberloafing through desktop computers and laptops. In the items of this survey, tablets and smartphones are added as well, since the use of those devices has increased considerably since 2005 (CBS, 2015). The items of this scale are translated into Dutch and added to the survey. Additionally, three items of the cyberloafing scale of Ugrin and Pearson (2013) are added to the questionnaire, since this study uses a broader definition of cyberloafing than Lim (2002) has formulated. The three items measure the degree in which employees engage in *personal shopping*, *managing personal finances* and *social media*. The items are formulated the same as Lim's (2002) cyberloafing items, "*During office hours, how often do you use the Internet at work to do some online shopping for yourself?",* for which the same 5-point Likert scale is used. The items in this scale showed a high reliability (α = .88). Appendix B7 shows the items used to measure cyberloafing behavior.

Digital skills. The earlier mentioned digital skills framework of Van Deursen and Van Dijk (2014) showed high correlations with actual performance. Based on this framework, Van Deursen, Helsper and Eynon (2014) developed an instrument to measure digital skills, which is used in this study.

The 35-item scale can be subdivided in five categories:

1. 10-item Operational skills scale (α = .93)
2. 3-item Mobile skills scale (α = .82)
3. 8-item Information Navigation skills scale (α = .82)
4. 6-item Social skills scale (α = .85)
5. 8-item Creative skills scale

The fifth category, "Creative skills", is not included in the online survey, since the skills measured with these items transcend basic digital skills required for jobs that are not specifically focused on content creation or web design. The items of the other four categories are translated into Dutch and added to the survey. An example item is *"I know how to use shortcut keys (e.g. CTRL-C for copy, CTRL-S for save)"*. All questions had response options ranging from 1 "not at all true for me" to 5 "very true for me" and a "I don't know what this means" option was added. The items of the "Information Navigation" category were negatively formulated, and will be recoded in the analysis of the results. The total score on digital skills can thus be interpreted as the higher the better. Appendix B3 to B6 shows the categories and corresponding items used to measure digital skills.

Individual Work Performance. The Dutch *Individuele Werkprestatie Vragenlijst* (IWPV) (Koopmans, 2014) is used to measure older workers' individual work performance (see appendix B9 to B11). The 18-item scale can be subdivided into three categories; *task performance* (5 items, α = .85; appendix B9), *contextual performance* (8 items, α = .87, appendix B10), and *counterproductive work behavior* (5 items, α = .73, appendix B11). All

items had response options ranging from 1 “rarely” to 5 “always”. An example item for task performance is *“In the past three months, I was able to plan my work so that I finished it on time.”* An example item for contextual performance is *“I worked on keeping my work skills up-to-date”*. The five items of the counterproductive work behavior scale are negatively asked, for example *“I focused on the negative aspects of situations at work instead of the positive aspects*”. Since those five items have the same response options as the other items, those five items will be recoded in the analysis of the results. The total score on individual work performance can thus be interpreted as the higher the better.

Sociodemographic data. To gain more information about the respondents, some sociodemographic and work-related data were asked at the end of the survey. Appendix B12 shows the items that are used.

Statistical analysis

To answer the research question “What is the role of cyberloafing in the employability of older workers?” the proposed hypotheses and conceptual model will be tested. The first hypothesis will be tested through an independent samples T-test, to compare the mean scores on digital skills between the two age groups.

The analyses on hypothesis two, three and four will be first tested for respondents older than 50 years, because this study focuses on older workers. Subsequently, the same analyses will be conducted again on the younger group, in order to compare the results.

To test hypothesis two, three and four, three univariate regression analyses will be conducted to begin with, to see if there is a significant correlation between the variables. For hypothesis two, cyberloafing is the independent variable, and individual work performance is the dependent variable. For hypothesis three, cyberloafing is the independent variable, and digital skills is the dependent variable. For hypothesis four, digital skills is the independent variable, and individual work performance is the dependent variable. Additionally, a

multivariate regression analysis will be added in order to see if the effects change when corrected for other variables of the model. Hypothesis two and four will be tested again, for hypothesis two to correct for digital skills, and for hypothesis four to correct for cyberloafing.

Results

Table 3 shows correlations between the four main variables in this study; cyberloafing, digital skills, individual work performance and age. Except age and individual work performance, all variables appear to significantly correlate with each other.

Table 3. Correlations main variables

Variables	1	2	3	4
1. Cyberloafing	-			
2. Digital Skills	.233***	-		
3. Individual Work Performance	.038	.204***	-	
4. Age	-.231***	-.278***	.076	-

Note. *p<.10, **p<.05, ***p<.01. Age is transformed into a dummy variable, where 0 = "younger than 50 years" and 1 = "aged 50 years and older".

To test the first hypothesis, "Employees aged 50 years and older have a lower level of digital skills than employees younger than 50 years old", an independent samples T-test was conducted, to compare the means of both age groups. Although employees in both age groups show a very high score on digital skills, employees *under* 50 years score significantly higher ($F(230) = 4.188$, $p < .001$) than employees aged 50 years and *older*. This confirms the first hypothesis. Moreover, the distribution differs significantly between both age groups. The group of employees aged 50 years and older shows more distributed results than the group of employees younger than 50 years, which indicates that the differences in digital skills within the older group are bigger than the differences within the younger group. Table 4 shows the score differences between younger and older workers on the four distinguished categories of

digital skills measured in this study, that together determine the variable "digital skills". The scores on the four categories show significant differences between the age groups.

Table 4. Score differences in *Digital Skills* between age groups.

	< 50 years old		≥ 50 years old			
Measure	*M*	*SD*	*M*	*SD*	*F (1, 230)*	*p*
Operational Skills	4.69	.53	4.36	.67	3.91	<.001
Information Navigation Skills	4.55	.41	4.41	.51	2.37	.019
Social Skills	4.39	.56	4.11	.73	3.16	.002
Mobile Skills	4.49	.65	4.14	.81	3.50	.001
Digital Skills	4.56	.39	4.30	.51	4.19	<.001

Note. Digital Skills is the mean of the scores on *operational skills, information navigation skills, social skills* and *mobile skills.*

Older workers

The univariate regression analysis on the second hypothesis "Cyberloafing has a negative effect on individual work performance" shows non-significant results. The multivariate regression analysis that corrects for "digital skills" shows non-significant results as well. This contradicts the expectation that cyberloafing has a negative effect on individual work performance of older workers and rejects hypothesis two.

A univariate regression analysis on the third hypothesis "Cyberloafing has a positive effect on digital skills" showed significant outcomes. Cyberloafing is significantly associated with digital skills (β = .234, $t(36.021) = 3.628$, $p < .05$). Furthermore, cyberloafing explained a significant proportion of variance in digital skills ($R^2 = .055$, $F(1, 97) = 5.512$, $p < .05$). This is a small effect size (Cohen, 1988) and confirms the third hypothesis. Unfortunately, it is not possible to show evidence for the direction of this effect, since the data in this study are not longitudinal. Based on the theoretical foundation for the hypothesis, this direction is however assumed. Table 5 shows the results of the univariate regression analysis of hypothesis three.

Table 5. Digital Skills by Cyberloafing, ≥ 50 years old.

	β
Cyberloafing	.234**
N	97
Adjusted R-Square	.045

Note. *p<.10, **p<.05, ***p<.01

To test the fourth hypothesis, "Mastering digital skills has a positive effect on individual work performance", a univariate regression analysis was used again. As expected, digital skills are positively associated with individual work performance (β = .302, t(6.784) = 3.086, p < .05). Digital skills explained a significant proportion of variance in individual work performance (R^2 = .112, F(1,97) = 11.985, p < .05). The multivariate regression analysis that corrects for "cyberloafing" shows a significant association of digital skills with individual work performance as well (β = .293, t(6.483) = 2.896, p < .05). This is considered a medium-size effect (Cohen, 1988) and lends support to the fourth hypothesis. Table 6 shows the results of the univariate and multivariate regression analysis on hypothesis two and four.

Table 6. Individual Work Performance by Cyberloafing and Digital Skills, ≥ 50 years old.

	Univariate (β)	Multivariate (β)
Cyberloafing	.108	.039
Digital skills	.302***	.293***
N	97	97
Adjusted R-Square		.073

Note. *p<.10, **p<.05, ***p<.01

Younger workers

In order to investigate whether the effects found for respondents aged 50 years and older apply for the respondents under 50 years as well, the analyses are conducted again. The

univariate regression analysis on the second hypothesis again shows non-significant results. The multivariate regression analysis that corrects for "digital skills" shows non-significant results as well. Consequently, in both age groups no effect is found for cyberloafing on individual work performance. The univariate regression analysis on the third hypothesis shows non-significant results for the younger group, in contrast with the results of the analysis on the older group.

The univariate regression analysis on the fourth hypothesis shows digital skills to be positively associated with individual work performance of respondents younger than 50 years (β =.170, t(6.279) = 1.980, p = .05). Although both effects are significant, there is a difference in effect size. The analysis on the older respondents shows a medium-size effect, whereas this analysis shows a small-size effect (Cohen, 1988). The multivariate regression analysis that corrects for "cyberloafing" again shows a significant association of digital skills with individual work performance (β = .169, t(6.167) = 1.937, p = .05). Table 7 shows the results of the univariate and multivariate regression analyses on hypothesis two and four for younger workers.

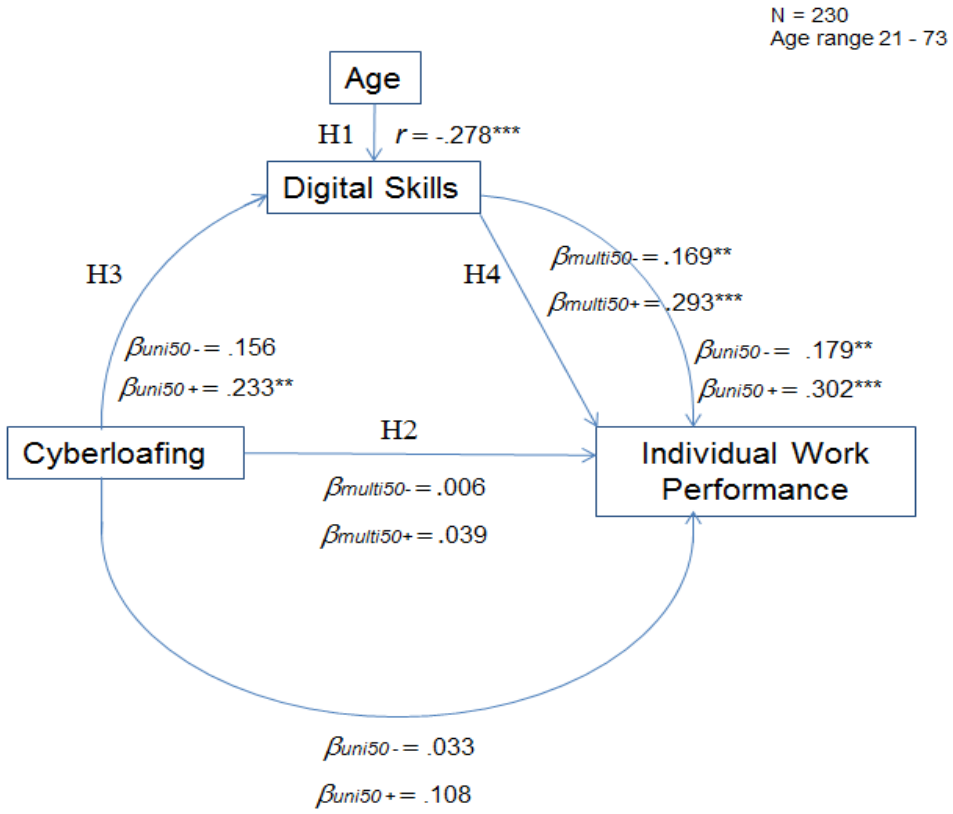
Table 7. Individual Work Performance by Cyberloafing and Digital Skills, < 50 years old.

	Univariate (β)	Multivariate (β)
Cyberloafing	.156	.006
Digital skills	.179**	.169**
N	133	133
Adjusted R-Square		.014

Note. *p<.10, **p<.05, ***p<.01

Path model

In addition to the proposed conceptual model, and to visualize the results of this study, figure 2 shows a path model. The curved lines represent the univariate regression outcomes, whereas the straight lines represent the multivariate regression outcomes. A distinction is made between the two age groups, respondents younger than 50 years old and respondents aged 50 years and older.



Note. *p<.10, **p<.05, ***p<.01

Figure 2. Path model

Discussion

The aim of this study was to investigate the role of cyberloafing in the employability of older workers. Based on existing literature, the expectation was that cyberloafing behavior has a direct negative effect on individual work performance, since surfing the internet for personal interests seems incompatible with a productive use of office hours. However, the

intended focus of this study was on potential positive effects of cyberloafing. Cyberloafing was expected to contribute to the development of digital skills, and therefore indirectly to the work performance of older workers.

At first, it is investigated whether there is still a discrepancy in the level of digital skills between younger and older workers. The age of 50 has been chosen as cut-off point, since people aged 50 years and older were – most likely – already working when the rise of the internet occurred in the late nineties of the 20th century. People under 50 years old got acquainted with the internet more naturally and in an earlier stage of their career or during their studies. A significant difference in the level of digital skills between younger and older workers was found. This lends support for the first hypothesis, that concerned differences in digital skills between age groups. In line with earlier research (Hargittai, 2002; Van Deursen & Van Dijk, 2011), older workers were again found to lag behind their younger colleagues with regard to digital skills. Anno 2016, in a more advanced stage of the digital era, the discrepancy in digital skills between age groups is still noticable. Although a significant difference in the level of digital skills between younger and older workers was found, the difference was very small. Older workers in this sample appear to have a sound level of digital skills. The high degree of self-reported digital skills among older workers can possibly be explained by the large number of highly educated respondents. Gui (2007) showed education level to be a relevant factor in the development of digital skills. The predominantly higher educated level of this sample may cause a distorted view of reality. Therefore, the results are not generalizable to the entire senior Dutch workforce. Another explanation could be the increased internet-penetration over the past 10 years. Research through the "digital divide" was mainly conducted in the first decade of the 21th century. Over the past ten years, digital media became even more ubiquitous. Apart from using digital media at school or at work, 96% of the Dutch households was connected to the internet in 2014 (CBS, 2015).

People are developing digital skills in many more informal ways, which Meyers et al. (2013) already stated.

In both age groups, no significant effect of cyberloafing on individual work performance was found. Employees seem to be able to engage in personal businesses during office hours – approximately 30 minutes per working day on average - without affecting their daily work performance. This finding contradicts existing literature, where cyberloafing was accused to cause a decline in productivity (Lim, 2002; Mastralango et al., 2006). An explanation for this could be that work performance does not always take place during traditional office hours nowadays. Major technological developments in the past decades made different forms of working possible and faded the boundary between work and private life. Ten Brummelhuis, Bakker, Hetland and Keulemans (2012) defined the Dutch concept "Het Nieuwe Werken" as a flexible organization where employees can determine when and where they work, supported by a medium for communication. This means office hours are no longer necessarily between 9am and 5pm, which traditionally was the case. Employees are increasingly available for work outside their office hours as well. This makes it difficult to judge about productivity or work performance. Moreover, it should be taken into account that individual work performance is measured with a self-report scale, which may affect the accuracy of this measurement (Chan, 2009).

An interesting outcome is the small, but significant, positive effect of cyberloafing on the level of digital skills. Older workers that engage in cyberloafing behavior, seem to actually learn something. This is in line with the expectations, where cyberloafing was considered to be an informal learning tool. Surfing the web for personal purposes during office hours makes older workers discover the possibilities of the web and practice their skills. This effect is not found for employees younger than 50 years. An explanation for this could be that their high skill level does not benefit furthermore from this relatively simple

activity. As mentioned before, the direction of this effect cannot be demonstrated, since the data in this study are not longitudinal. Therefore, this finding must be interpreted carefully. Knowing this, one could speculate that for older employees that have less digital skills, it would help to engage in a certain degree of cyberloafing in order to boost their digital skills. It should thereby be considered what the required skills for a specific job are. A practical implication flowing from this finding, is to at least not prohibit cyberloafing behavior entirely. This is in line with Case and Young (2002), who state that being overly strict concerning internet usage at work negatively influences employee satisfaction and perceived fairness.

As expected, this study showed digital skills to be important indicators for the work performance of older employees. For employees younger than 50 years, a significant effect was found as well, although this effect was considerably weaker than for the older group. An explanation for this difference could be that younger workers have a significantly higher level of digital skills, and their work performance is therefore determined by other competences. These findings lend support to the fourth hypothesis and are an important outcome, in line with other conclusions in this research field. Meyers et al. (2013) argue digital skills are necessary to effectively participate in our "new digital world", including the labor market. Eshet (2012) states digital skills became "survival skills", and are essential to navigate successfully through the digital era. One of the main motives to conduct this research, was the predominantly economic choice to delay the retirement age, not taking into account the difficulties aging workers come across. The demonstrated indispensableness of digital skills in the work domain implies that employers, HR professionals, policy makers, and employees themselves do well paying attention to the development and maintenance of digital skills of older workers. Without those skills, it is difficult to remain employable in the digital era.

Limitations

This study has limitations. The first methodological limitation is the self-rating character of the survey. Respondents were asked to answer questions about themselves. Scientists argue that self-ratings in psychometric research are generally unreliable (Chan, 2009). Hofstee (1994, p.153) agrees with this statement by the following quote "There is only one me, whereas there are many others who know enough about me to provide a more reliable average judgement. Thus, other things being equal, I am outnumbered and outperformed by the average other". Self-ratings are associated with concerns about for example wording of questions, order of questions, and social desirability responding as sources of random or systematic measurement errors that affect the construct validity adversely (Couch & Keniston, 1960; Cronbach, 1946; Nisbett & Wilson, 1977). In line with this, there are more recently investigated concerns about for example the *self-enhancement bias*, which states a self-perception is overly positive (Kwan, John, Kenny, Bond & Robins, 2004). Knowing this, the key concepts of this study should ideally be measured in a different way. For example, digital skills could be measured by letting respondents perform actual digital tasks that are relevant to their jobs. Cyberloafing could be measured by counting the minutes employees are actually using the internet for personal purposes during office hours. Work performance could be measured by asking direct colleagues or managers for a 360-degree feedback view. Unfortunately, due to lack of time and resources it was not possible to use those kind of research instruments. Therefore, existing and validated self-report items have been chosen to measure the main variables. Spector (2006) argued self-report data are not really that bad and unfairly received a negative reputation. Chan (2009) states the importance of considering both the truths and myths associated with the concerns of self-report data.

Secondly, although the cross-sectional research design does fit the innovative approach of this study, a different research design would be desirable in future research. Analyses on longitudinal data allow for example to draw conclusions about the direction of an effect, which would be very valuable in this case. Since a laboratory setting seems impractical to measure cyberloafing behavior, a field study seems more suitable. A field study allows to observe actual cyberloafing behavior and to gain more accurate measurements of relevant digital skills and work performance.

Thirdly, given the high level of digital skills measured among the respondents in this sample, together with the small effect of cyberloafing on digital skills, there must be many more ways in which employees train their digital skills. This study did not take along the time people spend on digital media use at home, or for their work purposes. It would be interesting for future research to map different sources of digital skill development, in order to provide lower skilled employees and organizations with targeted training or intervention programs. Furthermore, future research should involve lower educated respondents in the sample as well.

Fourthly, Vitak, Crouse and LaRose (2011) found that people who use internet access more for their work purposes also tended to engage more in cyberloafing behavior, in comparison with people who do not use internet access for work purposes. Future research should take differences in job nature into account as well. It might be more difficult to estimate the degree of internet use for personal purposes for employees who use the same channels for work and private purposes. An online marketeer visits social network sites like Facebook and Twitter on a daily basis. For this job type, the boundary between private and work is probably more vague.

Future research

The results of this study confirm the expected importance of mastering digital skills in performing well at work. This is in line with earlier studies concerning the necessity of having skills to operate in the digital era (Meyer, 2008; Leahy & Wilson, 2014). Remaining employable in the digital era demands more than just skills to navigate through the web. Technological developments keep going on a fast rate and keep changing the environment in which we live and work. Skills that are needed today, can be less valuable tomorrow. To keep up with those changing demands, a certain ability to adapt to continuous change seems a necessary competence for all employees. An interesting implication for future research would be to map important predictors of employability in the current era. An explorative study in what is needed, apart from "practical" skills, to successfully function in a changing environment would be relevant. One could think about investigating the relationship between personality factors and ability to adapt to change, or developing a tool to accurately measure the ability to adapt to change.

Conclusion

Based on the results presented in this study, a nuanced conclusion can be drawn about the role of cyberloafing in the employability of older workers. It can be prudently said that cyberloafing slightly contributes to the employability of older workers. Although this study cannot state anything about a direct effect of cyberloafing on employability, implications about a small positive role of cyberloafing in the development of digital skills and therefore performance of older workers can be made. Older workers that engage in cyberloafing behavior, are mastering slightly more digital skills than older workers that do engage less in cyberloafing. In line with the expectations, mastering digital skills appeared to be an important predictor for work performance nowadays. The continuously changing job demands of the future are expected to require more than practical skills, where future

research should focus on. An advice for HR professionals and policy makers to encourage all older employees to engage in more cyberloafing behavior, would not be a convenient recommendation. However, a practical implication is to at least not prohibit cyberloafing behavior entirely, and to focus on ways to have older employees maintain their digital skills, in order to remain employable until their delayed retirement.

References

Ala-Mutka, K., Punie, Y., & Redecker, C. (2008). Digital competence for lifelong learning. *Institute for Prospective Technological Studies (IPTS), European Commission, Joint Research Centre. Technical Note: JRC, 48708*, 271-282.

Belt, V., & Richardson, R. (2005). Social Labour, Employ ability and Social Exclusion: Pre-employment Training for Call Centre Work. *Urban Studies, 42*(2), 257-270.

Blanchard, A. L., & Henle, C. A. (2008). Correlates of different forms of cyberloafing: The role of norms and external locus of control. *Computers in Human Behavior*, *24*(3), 1067-1084.

Bosworth, B., & Collins, S. M. (2003). The empirics of growth: An update. *Brookings papers on economic activity, 2003*(2), 113-206.

Calo, T. (2008). Talent management in the era of the aging workforce: The critical role of knowledge transfer. *Public Personnel Management*, Vol. 37, No. 4,p. 403-416. Retrieved November 6, 2009, from ProQuest Business database.

Case, C. J., & Young, K. S. (2002). Employee Internet management: Current business practices and outcomes. *CyberPsychology & Behavior*, *5*(4), 355-361.

Centraal Bureau voor de Statistiek (2015, 11 maart). *Tablet verdringt bord van schoot.* Retrieved from https://www.cbs.nl/nl-nl/nieuws/2015/11/tablet-verdringt-bord-van-schoot

Centraal Bureau voor de Statistiek (2016, 20 juni). *Bevolking; geslacht, leeftijd en burgerlijke staat, 1 januari.* Retrieved from https://www.cbs.nl/nl-nl/visualisaties/bevolkingspiramide

Chan, D. (2009). So why ask me? Are self-report data really that bad. *Statistical and methodological myths and urban legends: Doctrine, verity and fable in the organizational and social sciences*, 309-336.

Charchat-Fichman, F. H., Caramelli, P., Sameshima, K., & Nitrini, R. (2005). Declínio da

capacidade cognitiva durante o envelhecimento [Decline of cognitive capacity during aging]. *Revista Brasileira de Psiquiatria, 27*(21), 79-82.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*, 2nd ed. NY: Taylor & Francis.

Couch, A., & Keniston, K. (1960). Yeasayers and naysayers: agreeing response set as a personality variable. *The Journal of Abnormal and Social Psychology, 60*(2), 151.

Cronbach, L. J. (1946). Response sets and test validity. *Educational and psychological measurement, 6*(4), 475-494.

Damman, M., Henkens, K., & Kalmijn, M. (2013). Late-career work disengagement: The role of proximity to retirement and career experiences. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences, 68*(3), 455-463.

Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E. & Starr, J. M. (2009). Age-associated cognitive decline. *British medical bulletin*, *92*(1), 135-152.

De Grip, A., Dupuy, A., Jolles, J., & van Boxtel, M. (2015). Retirement and cognitive development in the Netherlands: Are the retired really inactive?. *Economics & Human Biology, 19*, 157-169.

De Haan, J., Huysmans, F., & Steyaert, J. (2002). Van huis uit digitaal. Retrieved on June 1st, from http://www.scp.nl/Publicaties/Alle_publicaties/Publicaties_2002/Van_huis_uit_digitaal

Dohm, A., & Shniper, L. (2007). Occupational employment projection to 2016. *Monthly Lab. Rev.*, *130*, 86.

Easterly, W., & Levine, R. (2001). What have we learned from a decade of empirical research on growth? It's Not Factor Accumulation: Stylized Facts and Growth Models. *the world bank economic review, 15*(2), 177-219.

European Commission and Council, E. (2006). Recommendation of the European Parliament and the Council of 18 December 2006 on key competencies for lifelong learning.

Brussels: Official Journal of the European Union, *30*(12), 2006.Retrieved on juni 16th from: http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_394/l_39420061230en00100018.pdf

Eshet, Y. (2012). Thinking in the digital era: A revised model for digital literacy. *Issues in Informing Science and Information Technology*, *9*(2), 267-276.

Gui, M. (2007). Formal and substantial Internet information skills: The role of socio-demographic differences on the possession of different components of digital literacy. *First Monday*, *12*(9).

Hargittai, E. (2002). Beyond logs and surveys: In-depth measures of people's web use skills. *Journal of the American Society for Information Science and Technology*, *53*(14), 1239-1244.

Hofstee, W. K. (1994). Who should own the definition of personality?. *European Journal of Personality*, *8*(3), 149-162.

Johnson, S., & Burden, T. (2005). *Young people, employability and the induction process.* Joseph Rowntree Foundation, York, England.

Koopmans, L. (2014). *Measuring individual work performance.* PhD Dissertation, VU University medical center, Amsterdam, The Netherlands.

Kray, J., & Lindenberger, U. (2000). Adult age differences in task switching. *Psychology and aging*, *15*(1), 126.

Kwan, V. S., John, O. P., Kenny, D. A., Bond, M. H., & Robins, R. W. (2004). Reconceptualizing individual differences in self-enhancement bias: an interpersonal approach. *Psychological review*, *111*(1), 94.

Leahy, D., & Wilson, D. (2014, July). Digital skills for employment. In *IFIP Conference on Information Technology in Educational Management* (pp. 178-189). Springer Berlin Heidelberg.

Lim, V. K. (2002). The IT way of loafing on the job: cyberloafing, neutralizing and organizational justice. *Journal of Organizational Behavior*, *23*(5), 675-694.

Lim, V. K., & Chen, D. J. (2012). Cyberloafing at the workplace: gain or drain on work? *Behaviour & Information Technology*, *31*(4), 343-353.

Lim, V. K., & Teo, T. S. (2005). Prevalence, perceived seriousness, justification and regulation of cyberloafing in Singapore: An exploratory study. *Information & Management*, *42*(8), 1081-1093.

Lupton, M. K., Stahl, D., Archer, N., Foy, C., Poppe, M., Lovestone, S., & Abraham, R. (2010). Education, occupation and retirement age effects on the age of onset of Alzheimer's disease. *International journal of geriatric psychiatry*, *25*(1), 30-36.

Mahatanankoon, P. (2006). Predicting cyber-production deviance in the workplace. International Journal of Internet and Enterprise Management, 4, 314–330.

Marchi, G. R. (1999). The role of the Internet in learning organizations.

Mastrangelo, P. M., Everton, W., & Jolton, J. A. (2006). Personal use of work computers: Distraction versus destruction. *CyberPsychology & Behavior*, *9*(6), 730-741.

Mazzonna, F., & Peracchi, F. (2012). Ageing, cognitive abilities and retirement. *European Economic Review*, *56*(4), 691-710.

McQuaid, R. W., & Lindsay, C. (2005). The concept of employability. *Urban studies*, *42*(2), 197-219.

Meyer, J. (2007). Older workers and the adoption of new technologies. *ZEW-Centre for European Economic Research Discussion Paper*, (07-050).

Meyers, E. M., Erickson, I., & Small, R. V. (2013). Digital literacy and informal learning environments: an introduction. *Learning, Media and Technology*, *38*(4), 355-367.

Morris, M. G., & Venkatesh, V. (2000). Age differences in technology adoption decisions: Implications for a changing work force. *Personnel psychology*, *53*(2), 375-403.

Nisbett, R. E., & Wilson, T. D. (1977). The halo effect: Evidence for unconscious alteration of judgments. *Journal of personality and social psychology*, *35*(4), 250.

Paton, N. (2008). Manager At Work: Organizations ignore the transfer of knowledge. *The Edge Singapore.*

Quesenberry, J. L., & Trauth, E. M. (2005). The Role of Ubiquitous Computing in Maintaining Work-Life Balance: Perspectives from Women in the Information Technology Workforce. In d*esigning ubiquitous information environments: Socio-technical issues and challenges* (pp. 43-55). Springer US.

Reimers, S., & Maylor, E. A. (2005). Task switching across the life span: effects of age on general and specific switch costs. *Developmental psychology*, *41*(4), 661.

Roman, L. A. (1996). Survey: employees traveling in cyberspace while on the clock. Memphis Business Journal, 10, 2–3.

Ryan, J. (2010). *A History of the Internet and the Digital Future*. Reaktion Books.

Sanders, J., Jetten, A., Dhondt, S., Geuskens, G., Keijzer, L., & Liebregts, W. (2013). *Mentale pensionering: een onderzoek naar kenmerken, de determinanten en gevolgen* (No. R13089). TNO.

Siemens, G. (2006). Connectivism: Learning theory or pastime of the self-amused. *Manitoba, Canada: Learning Technologies Centre*.

Spector, P. E. (2006). Method variance in organizational research truth or urban legend?. *Organizational research methods*, *9*(2), 221-232.

Stevens, R. H. (2010). Managing human capital: How to use knowledge management to transfer knowledge in today's multi-generational workforce. *International Business Research*, *3*(3), 77.

Ten Brummelhuis, L. L., Bakker, A. B., Hetland, J., & Keulemans, L. (2012). Do new ways of working foster work engagement? *Psicothema*, *24*(1), 113-120.

Ugrin, J. C., Pearson, J. M., & Odom, M. D. (2008). Profiling cyber-slackers in the workplace: Demographic, cultural, and workplace factors. *Journal of Internet Commerce*, *6*(3), 75-89.

Ugrin, J. C., & Pearson, J. M. (2013). The effects of sanctions and stigmas on cyberloafing. *Computers in Human Behavior*, *29*(3), 812-820.

Van Deursen, A. J., Helsper, E., & Eynon, R. (2014). Measuring digital skills: From digital skills to tangible outcomes.

Van Deursen, A., & Van Dijk, J. (2011). Internet skills and the digital divide. *new media & society*, *13*(6), 893-911.

Van Dijk, J. A. (2005). *The deepening divide: Inequality in the information society*. Sage Publications.

Van Dijk, J. A., & van Deursen, A. J. (2014). *Digital skills: Unlocking the information society*. Palgrave Macmillan.

Van Duin, C., & Stoeldraijer, L. (2012). Bevolkingsprognose 2012-2060: langer leven, langer werken. *Den Haag, Centraal Bureau voor de Statistiek.*

Verton, D. (2000). Employers ok with e-surfing. Computerworld, 34, 1, 16. 694

Vitak, J., Crouse, J., & LaRose, R. (2011). Personal Internet use at work: Understanding cyberslacking. *Computers in Human Behavior*, *27*(5), 1751-1759.

Wagner, D. T., Barnes, C. M., Lim, V. K., & Ferris, D. L. (2012). Lost sleep and cyberloafing: Evidence from the laboratory and a daylight saving time quasi-experiment. *Journal of Applied Psychology*, *97*(5), 1068.

Wallace, P. (2004). *The Internet in the workplace: How new technology is transforming work.* Cambridge University Press.

Whalley, L. J., Deary, I. J., Appleton, C. L., & Starr, J. M. (2004). Cognitive reserve and the neurobiology of cognitive aging. *Ageing research reviews*, *3*(4), 369-382.Xie, B.

(2003). Older adults, computers, and the Internet: Future directions. *Gerontechnology*, *2*(4), 289-305.

Appendix A. Score differences.

Table 1. Differences in *Cyberloafing Behavior* between age groups.

	< 50 years old		≥ 50 years old			
Measure	*M*	*SD*	*M*	*SD*	*F (1, 230)*	*p*
Reading personal e-mail	2.54	.93	2.16	.79	3.33	.001
Sending personal e-mail	2.18	.85	2.08	.77	.90	.371
Visiting non-work related websites	2.34	.85	2.13	.79	1.86	.065
Visiting news websites	2.56	1.06	2.24	.99	2.32	.021
Visiting sports websites	1.61	.82	1.30	.63	3.25	.001
Instant messaging non-work related	2.69	1.04	2.24	.90	3.55	<.001
Download non-work related content	1.44	.67	1.41	.57	.37	.710
Searching vacancies	1.38	.55	1.20	.40	3.01	.003
Online shopping	1.47	.70	1.20	.47	3.59	<.001
Online games	1.05	.24	1.04	.25	.12	.905
Visiting adult entertainment websites	1.04	.23	1.03	.17	.24	.809
Social media non-work related	2.21	1.00	1.76	.88	3.53	.001
Banking non-work related	1.80	.84	1.57	.82	2.07	.039
Cyberloafing behavior	1.86	.51	1.64	.42	3.59	<.001

Note. Cyberloafing behavior is the mean of the scores on the 13 items mentioned above.

Table 2. Score differences in *Individual Work Performance* between age groups.

	< 50 years old		≥ 50 years old			
Measure	*M*	*SD*	*M*	*SD*	*F (1, 230)*	*p*
Task Performance	3.53	.80	3.71	.71	- 1.77	.079
Contextual Performance	3.44	.72	3.27	.86	1.61	.109
Counterproductive Work Behavior*	4.35	.49	4.55	.40	- 3.42	.001
Individual Work Performance	3.77	.45	3.84	.47	- 1.15	.180

Note. Counterproductive work behavior is being recoded, because the items were negatively formulated.

Appendix B. Online survey.

B1. Informed Consent

Beste heer/mevrouw,

Deze vragenlijst maakt deel uit van een onderzoek van de Vrije Universiteit van Amsterdam. In het onderzoek wordt gekeken naar hoe medewerkers gebruik maken van internet tijdens werkuren. Het gaat om een **eenmalige** vragenlijst die maximaal **10 minuten** duurt.

Doordat alle respondenten gebruik maken van dezelfde weblink is niet te achterhalen wie welke vragenlijst heeft ingevuld. Uw privacy is daarmee gegarandeerd. Deelname aan de vragenlijst is geheel vrijwillig. Mocht u tijdens het invullen van de vragen toch willen stoppen, dan kan dat op ieder moment, zonder enige consequenties.

U wordt vriendelijk verzocht de vragen zo veel mogelijk naar waarheid in te vullen en op uw eerste ingeving af te gaan. Indien u vragen of opmerkingen heeft over de vragenlijst, kunt u contact opnemen met de verantwoordelijke onderzoekster, Hester Brakel (hesterbrakel@hotmail.com).

Alvast hartelijk dank voor uw deelname!

B2. Statement of participation

Ik verklaar hierbij:

- Dat ik weet dat ik bij (toekomstige) vragen contact kan opnemen met Hester Brakel.
- Dat ik weet dat mijn privacy in dit onderzoek is gegarandeerd.
- Vrijwillig in te stemmen met deelname aan dit onderzoek.
    - o Ja, ik verklaar hierbij akkoord te gaan met bovenstaande stellingen en neem deel aan het onderzoek.
    - o Nee, ik ga niet akkoord en doe niet mee aan het onderzoek.

B3. Digital Skills – Operational Skills

Geef voor onderstaande stellingen aan in welke mate het voor u van toepassing is. Als u niet begrijpt waar de stelling over gaat, dan kiest u de optie 'ik begrijp niet waar dit over gaat'.

1. Ik weet hoe ik bestanden moet downloaden en openen
2. Ik weet hoe ik een foto van het internet moet downloaden en opslaan
3. Ik weet hoe ik ‘short cut’ toetsen moet gebruiken (bijvoorbeeld CTRL-C voor kopiëren, CTRL-S voor opslaan)
4. Ik weet hoe ik een nieuw tabblad moet openen in mijn browser
5. Ik weet hoe ik een website moet opslaan
6. Ik weet waar ik moet klikken om naar een andere pagina te gaan
7. Ik weet hoe ik online formulieren moet invullen
8. Ik weet hoe ik bestanden moet uploaden

9. Ik weet hoe ik privacy instellingen aan moet passen
10. Ik weet hoe ik op een WiFi netwerk moet komen

Antwoordopties:
1 = Klopt helemaal niet, 2 = Klopt niet, 3 = Klopt een beetje, 4 = Klopt, 5 = Klopt helemaal, 6 = Ik begrijp niet waar dit over gaat

B4. Digital skills – Information Navigation skills
Geef voor onderstaande stellingen aan in welke mate het voor u van toepassing is. Als u niet begrijpt waar de stelling over gaat, dan kiest u de optie 'ik begrijp niet waar dit over gaat'.

1. Ik vind het moeilijk om te bepalen wat de beste zoekterm is om iets online op te zoeken
2. Ik vind het moeilijk om een website terug te vinden die ik eerder heb bezocht
3. Ik word moe van het online opzoeken van informatie
4. Soms kom ik bij een website terecht zonder te weten hoe ik er gekomen ben
5. Ik vind het design van de meeste websites verwarrend
6. De diversiteit van de lay-outs van websites maakt het werken met internet lastig
7. Ik zou een cursus moeten volgen om online informatie te vinden
8. Soms vind ik het moeilijk om informatie te verifiëren die ik heb ontvangen

Antwoordopties:
1 = Klopt helemaal niet, 2 = Klopt niet, 3 = Klopt een beetje, 4 = Klopt, 5 = Klopt helemaal, 6 = Ik begrijp niet waar dit over gaat

B5. Digital skills – Social Skills
Geef voor onderstaande stellingen aan in welke mate het voor u van toepassing is. Als u niet begrijpt waar de stelling over gaat, dan kiest u de optie 'ik begrijp niet waar dit over gaat'.

1. Ik weet welke informatie ik wel en niet online moet delen
2. Ik weet wanneer ik informatie wel en niet online moet delen
3. Ik ben zorgvuldig in het uiten van mijn online gedragingen (bijvoorbeeld het geven van commentaar)
4. Ik weet hoe ik op social media moet aanpassen welke informatie er van mij zichtbaar is voor anderen (bijvoorbeeld voor vrienden, vrienden van vrienden of publiek)
5. Ik weet hoe ik op social media vrienden moet verwijderen uit mijn lijst met contacten
6. Ik voel mij comfortabel bij het bepalen wie ik online volg op social media

Antwoordopties:
1 = Klopt helemaal niet, 2 = Klopt niet, 3 = Klopt een beetje, 4 = Klopt, 5 = Klopt helemaal, 6 = Ik begrijp niet waar dit over gaat, 7 = n.v.t.

B6. Digital Skills – Mobile Skills
Geef voor onderstaande stellingen aan in welke mate het voor u van toepassing is. Als u niet begrijpt waar de stelling over gaat, dan kiest u de optie 'ik begrijp niet waar dit over gaat'.

1. Ik weet hoe ik apps moet downloaden op een tablet of smartphone
2. Ik weet hoe ik apps moet downloaden op mijn eigen tablet of smartphone
3. Ik weet hoe ik bij kan houden wat de kosten zijn van mijn mobiele app gebruik

Antwoordopties:
1 = Klopt helemaal niet, 2 = Klopt niet, 3 = Klopt een beetje, 4 = Klopt, 5 = Klopt helemaal, 6 = Ik begrijp niet waar dit over gaat, 7 = n.v.t.

B7. Cyberloafing
Hoe vaak voert u - **onder werktijd** - onderstaande activiteiten uit, op een desktop computer, laptop, tablet of smartphone?

1. Het lezen van niet-werk gerelateerde e-mail (bijvoorbeeld e-mail van vrienden of familie)
2. Het versturen van niet-werk gerelateerde e-mail
3. Het bezoeken van niet-werk gerelateerde websites
4. Het bezoeken van algemene nieuws websites (bijvoorbeeld nu.nl of nos.nl)
5. Het bezoeken van sportwebsites
6. Online berichten versturen en ontvangen voor persoonlijke doeleinden (bijvoorbeeld WhatsApp of instant messaging via social networksites)
7. Het downloaden van niet-werk gerelateerde bestanden (bijvoorbeeld afbeeldingen of muziek)
8. Online kijken naar vacatures
9. Online shoppen voor persoonlijke doeleinden
10. Online spelletjes spelen
11. Het bezoeken van websites bedoeld voor volwassenen (bijvoorbeeld seksueel getinte websites)
12. Het bezoeken van social media voor persoonlijke doeleinden (bijvoorbeeld LinkedIn, Facebook of Twitter)
13. Het uitvoeren van bankzaken voor persoonlijke doeleinden (bijvoorbeeld internetbankieren of het checken van de beurskoers)

Antwoordopties:

1 = Nooit, 2 = Soms, 3 = Regelmatig, 4 = Vaak, 5 = Altijd

B8. Cyberloafing – Time

Hoeveel tijd besteedt u tijdens een normale werkdag gemiddeld aan het gebruik van internet voor **persoonlijke doeleinden**? (… uur … minuten)

Hoeveel tijd besteedt u buiten werktijd gemiddeld per dag aan het gebruik van internet voor **werkdoeleinden**? (… uur … minuten)

B9. Individual Work Performance – Task Performance

In de afgelopen 3 maanden…

1. Lukte het mij om mijn werk zo te plannen, dat het op tijd af was
2. Hield ik voor ogen welk resultaat ik moest behalen met mijn werk
3. Lukte het mij om hoofdzaken van bijzaken te scheiden
4. Lukte het mij om mijn werk goed uit te voeren met zo min mogelijk tijd en inspanning
5. Heb ik een optimale planning gemaakt

Antwoordopties:

1 = Zelden, 2 = Soms, 3 = Regelmatig, 4 = Vaak, 5 = Altijd

B10. Individual Work Performance – Contextual Performance

In de afgelopen 3 maanden…

1. Ben ik uit mezelf met nieuwe taken begonnen, als mijn oude taken af waren
2. Heb ik uitdagende werktaken op me genomen, als die er waren
3. Heb ik gewerkt aan het bijhouden van mijn vakkennis
4. Heb ik gewerkt aan het bijhouden van mijn werkvaardigheden
5. Kwam ik met creatieve oplossingen voor nieuwe problemen
6. Heb ik extra verantwoordelijkheden op me genomen
7. Zocht ik steeds naar nieuwe uitdagingen in het werk
8. Had ik een actieve inbreng in werkoverleg of vergaderingen

Antwoordopties:

1 = Zelden, 2 = Soms, 3 = Regelmatig, 4 = Vaak, 5 = Altijd

B11. Individual Work Performance – Counterproductive Work Behavior

In de afgelopen 3 maanden…

1. Heb ik geklaagd over onbelangrijke zaken op mijn werk
2. Heb ik problemen groter gemaakt dan ze waren op mijn werk
3. Heb ik me gericht op de negatieve kanten van een werksituatie, in plaats van op de positieve kanten
4. Heb ik gepraat met collega’s over de negatieve kanten van mijn werk

5. Heb ik gepraat met mensen van buiten de organisatie over de negatieve kanten van mijn werk.

1 = Zelden, 2 = Soms, 3 = Regelmatig, 4 = Vaak, 5 = Altijd

B12. Sociodemographic and work-related information

In het laatste gedeelte van de vragenlijst worden een aantal algemene vragen gesteld.

1. Wat is uw geslacht?

   A. Man

   B. Vrouw

   C. Wil ik liever niet zeggen

2. Wat is uw leeftijd? … jaar

3. Wanneer bent u van plan om met pensioen te gaan?

   A. Binnen zes jaar

   B. Over meer dan zes jaar

   C. Ik had al eerder met pensioen willen gaan

   D. Ik weet het nog nie

4. Wat is uw hoogst afgeronde opleiding?

   A. LBO, MAVO of VMBO

   B. MBO, HAVO of VWO

   C. HBO of WO

5. In welke sector bent u werkzaam?

   A. Industrie

   B. Bouw

   C. MKB

   D. Logistiek

   E. ICT

   F. Bank- en verzekeringswezen

   G. Onderwijs

H. Overheid

I. Gezondheids- en welzijnszorg

J. Cultuur, sport en recreatie

K. Overig, namelijk …

6. Voor welke organisatie bent u werkzaam? (Niet verplicht) …….

7. Wat is uw huidige functie?

   A. Medewerk(st)er

   B. Leidinggevende

   C. Directeur/ directrice

   D. Anders

8. Wat is uw dienstverband?

   A. Parttime

   B. Fulltime

9. Hoe vaak is het voor uw werkzaamheden noodzakelijk om gebruik te maken van een computer, laptop, tablet of smartphone met internetverbinding? (Bijvoorbeeld voor communicatie via e-mail)

   A. Nooit

   B. Maandelijks

   C. Wekelijks

   D. Dagelijks: een klein deel van mijn werkdag

   E. Dagelijks: een groot deel van mijn werkdag

10. Hoeveel uur besteedt u gemiddeld per werkdag achter een computer, laptop of tablet met internetverbinding?

B13. Debriefing

Hartelijk dank voor uw deelname aan deze vragenlijst!

Het doel van dit onderzoek is om te kijken of internetgebruik (voor persoonlijke doeleinden, tijdens werktijd) kan bijdragen aan de beheersing van digitale vaardigheden en daarmee aan de inzetbaarheid van medewerkers.

Bent u benieuwd naar de resultaten van de gehele steekproef? Na 23 augustus zullen deze bekend zijn en kunt u de conclusie van het onderzoek opvragen. Let op: resultaten per organisatie of individuele resultaten kunnen en mogen omwille van privacy redenen niet verstrekt worden.

Heeft u verder vragen over het onderzoek? Dan kunt u altijd contact opnemen via hesterbrakel@hotmail.com of k.mortier@vu.nl.